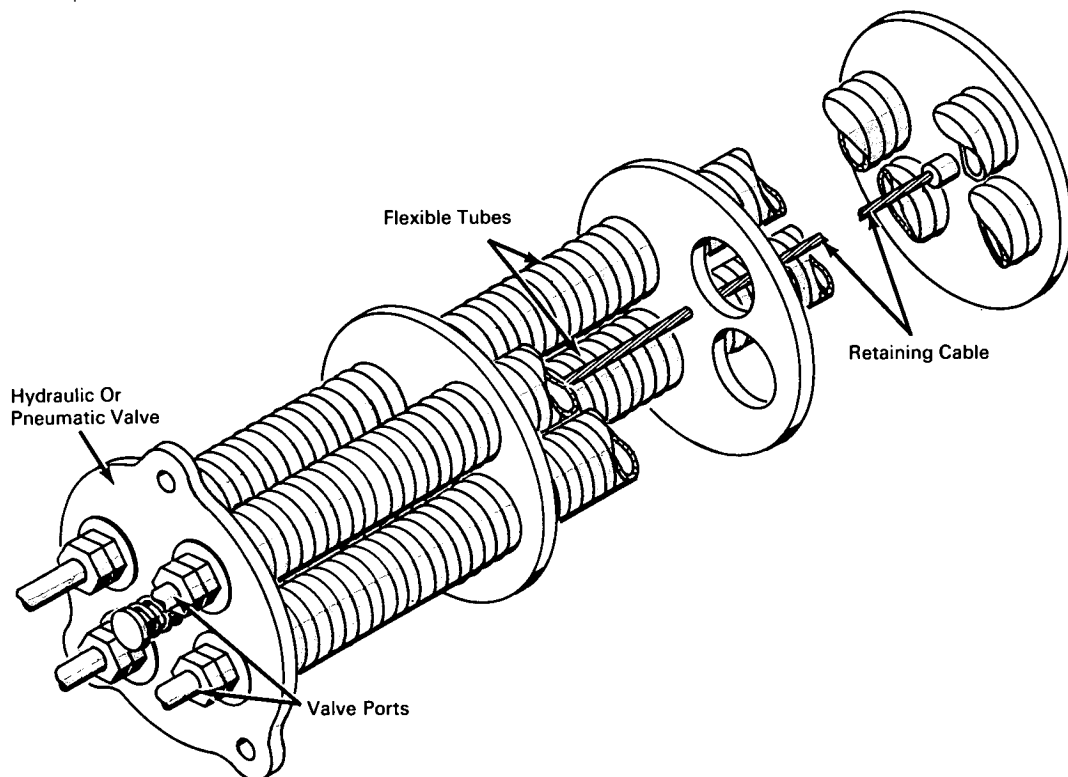


NASA TECH BRIEF



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Hydraulically Controlled Flexible Arm Can Bend in Any Direction



The problem:

To design a flexible arm that can bend in any direction.

The solution:

An arm assembly consisting of four flexible tubes controlled by a four-way hydraulic or pneumatic valve.

How it's done:

Positioning of the flexible arm is controlled by a four-way hydraulic or pneumatic valve. Each port of

the valve is connected to one of the four flexible tubes of the arm. Fluid, under pressure, is routed through the valve ports to the tubes. When equal pressure is applied to the tubes, they expand equally and become rigid. When different pressures are applied to the tubes, unequal expansion results and the arm bends. The retainer cable, which is in a state of tension, restrains tube expansion, maintaining equilibrium. By varying the pressure through the valve ports, the flexible arm can be bent in any desired direction.

(continued overleaf)

Notes:

1. The flexible arm could be used for probing areas that cannot be reached by ordinary tools, handling hazardous materials, as a search mount for radar antennas, and for graph recording.
2. Inquiries concerning this innovation may be directed to:

Technology Utilization Officer
Kennedy Space Center
Kennedy Space Center, Florida 32899
Reference: B66-10626

Patent status:

No patent action is contemplated by NASA.

Source: F. D. Griffin
(KSC-66-20)